Claims

1. A drive circuit for an LED array which comprises a first LED cluster (40) and at least one second LED cluster (42; 44), a switch (S1, S2, S3) being arranged in series with each LED cluster (40, 42, 44), and each LED cluster (40, 42, 44) having a supply terminal via which it can be connected to a supply voltage (U_{Batt}), it being possible to drive each switch (S1, S2, S3) so as to permit a current flow in the associated LED cluster, having a control loop (46) which is designed to drive the switch (S1) of the first LED cluster (40) so as to achieve a constant mean value of the current (I_{LED}) flowing through the first LED cluster (40), the control loop (46) being designed to drive at least one switch (S2, S3) of a second LED cluster (42, 44), characterized in that the drive circuit further comprises:

   a total current detection device (R_{Mess}) with the aid of which it is possible to determine an actual magnitude (U_{Mess}) which corresponds to the sum of the currents through at least two, in particular through all of the second LED clusters (42, 44), and

   a comparison unit (50, 50a) in which the actual magnitude (U_{Mess}) can be compared with a prescribable desired magnitude (U_{OL}).

2. The drive circuit as claimed in claim 1, characterized in that the desired magnitude (U_{OL}) can be set by a user.

3. The drive circuit as claimed in claim 1 or 2, characterized in that the comparison unit (50, 50a) is designed to output an information signal (78) in the event of undershooting of the desired

magnitude (U_{OL}) by the actual magnitude (U_{Mess}).

4. The drive circuit as claimed in one of the preceding claims, characterized in that it comprises a monitoring unit (50, 50b), with which the current flow through the first LED cluster (40) can be monitored.

5. The drive circuit as claimed in claim 4, characterized in that the monitoring unit (50, 50b) is designed in such a way that the control loop (46) is disconnected when a current flow which is outside a prescribable tolerance range is determined in the first LED cluster (40).

6. The drive circuit as claimed in claim 4, characterized in that the monitoring unit (50, 50b) is designed in such a way that the first LED cluster (40) is disconnected when a current flow which is outside a prescribable tolerance range is determined in the first LED cluster (40), and a second LED cluster (42, 44) is made relative to the first LED cluster.

7. The drive circuit as claimed in one of the preceding claims, characterized in that it also comprises an undervoltage detection device (64) which is designed to output an undervoltage warning signal (76) when the supply voltage (U_{Batt}) falls below a prescribable value (U_{Ref1}).

8. The drive circuit as claimed in claim 7, characterized in that the prescribable value (U_{Ref1}) is equal to or greater than the sum of the forward voltages of all the LEDs of an LED cluster (40, 42, 44).

9. The drive circuit as claimed in one of claims 7 or 8, characterized in that the prescribable value

(U_{Ref1}) can be set manually or can be prescribed permanently.

10. The drive circuit as claimed in one of claims 3 to 9, characterized in that it also comprises an output unit (50, 50c, ST1) to which the information signal (78) and/or the undervoltage warning signal (76) can be transmitted.

11. The drive circuit as claimed in claim 10, characterized in that the output unit (50, 50c, ST1) comprises at least one transistor (ST1) which is located in an open collector circuit and whose base is connected to the comparison unit (50a) for the purpose of transmitting the information signal (78), and/or is connected to the undervoltage detection device (64) for the purpose of transmitting the undervoltage warning signal (76).

12. The drive circuit as claimed in one of the preceding claims, characterized in that it also comprises a closing delay device (74) which is designed to deactivate the output unit (50, 50c, ST1) for a predetermined time after the closure of the drive circuit.

13. The drive circuit as claimed in one of claims 10 to 12, characterized in that the output unit (50, 50c, ST1) comprises a flip-flop (88), the base of the transistor (ST1) being connected to the output of the flip-flop (88), and the set input (S) of the flip-flop (88) being connected to the undervoltage detection device (64) in order to transmit the undervoltage warning signal (76), and/or being connected to the comparison unit (50a) in order to transmit the information signal (78).

14. The drive circuit as claimed in one of claims 12

or 13, characterized in that the closing delay device (74) is designed to apply a closing delay signal (80) to the reset input (R) of the flip-flop (88) of the output unit (50, 50c, ST1) over the duration of the closing delay.

15. The drive circuit as claimed in one of the preceding claims, characterized in that the actual magnitude (U_{Mess}) corresponds to a time average value of the sum of the currents through at least two, in particular through all of the second LED clusters (42, 44).

16. A method for operating an LED array which comprises a first LED cluster (40) and at least one second LED cluster (42, 44), a switch (S1, S2, S3) being arranged in series with each LED cluster (40, 42, 44), and each LED cluster (40, 42, 44) having a supply terminal via which it can be connected to a supply voltage (U_{Batt}), comprising the following steps:

a) driving the switch (S1) of the first LED cluster (40) with a drive signal (CLK) so as to achieve a constant mean value of the current (I_{LED}) flowing through the first LED cluster (40), and driving at least one second LED cluster (42, 44) with the same drive signal (CLK),

b) measuring an actual magnitude (U_{Mess}) which corresponds to the sum of the currents through at least two, in particular through all of the second LED clusters (42, 44), and

c) comparing the actual magnitude (U_{Mess}) with a prescribable desired magnitude (U_{OL}).